

CLAIMS

1. A lid-member holder used to define envelopes encapsulating electronic components in production of hollow-package type electronic products, which comprises:
  - 5 a holder body; and
  - a plurality of lid members temporarily held by said holder body,

wherein said lid members are arranged so as to be consistent with an arrangement of surrounding wall members, which are to be sealed with said lid members in a lump to define said envelopes, and the temporary holding of said lid members by said holder body is realized such that lid members can be separated from the lid members after said surrounding wall members are completely sealed with said lid members, without said lid members being removed from said surrounding wall members.
- 10 2. A lid-member holder as set forth in claim 1, wherein said lid members are molded from a suitable resin material, using a metal mold in which said holder is incorporated, such that the temporary holding of said lid members by said holder body is achieved when the molding of said lid members is completed.
- 15 3. A lid-member holder as set forth in claim 2, wherein a surface of said holder body is subjected to a rough surface treatment, and the molded lid members are in mechanical engagement with the treated rough surface of said holder body, whereby the temporary holding of said lid members by said holder body is achieved by the mechanical engagement between the molded lid members and the treated rough surface of said holder body.
- 20 4. A lid-member holder as set forth in claim 3, wherein said holder body is formed with a plurality of openings which

are closed by said lid members, and a size of said openings is controlled to thereby regulate a holding force with which said lid members are held by said holder body.

5. A lid-member holder as set forth in claim 3, wherein  
a roughness of the treated rough surface of said holder body  
is controlled to regulate a holding force with which said lid  
members are held by said holder body.

6. A lid-member holder as set forth in claim 2, wherein  
said holder body is formed with a plurality of openings  
10 arranged so as to be consistent with the arrangement of said  
surrounding wall members, and each of the molded lid members  
has a stub portion which is in mechanical engagement with an  
inner peripheral wall surface of a corresponding one of said  
openings, whereby the temporary holding of said lid members  
15 by said holder body is achieved by the mechanical engagement  
between the molded lid members and the inner peripheral wall  
surfaces of said openings.

7. A lid-member holder as set forth in claim 6, wherein  
a contact area between the opening and the stub portion  
20 corresponding to each other is controlled to thereby regulate  
a holding force with which said lid members are held by said  
holder body.

8. A lid-member holder as set forth in claim 6, wherein  
each of said lid members further has a thin flange element  
25 integrally and radially extended from a top surface of the stub  
portions, and the respective stub portions with the thin  
flange elements are fitted into the openings such that each  
of the thin flange elements is in close contact with a surface  
30 of the holder body, which surrounds a corresponding opening,  
whereby the temporary holding of said lid members by said  
holder body is achieved by the stub portions with the thin  
flange elements.

9. A lid-member holder as set forth in claim 8, wherein

a thickness of said thin flange elements is controlled to thereby regulate a holding force with which said lid members are held by said holder body.

10. A lid-member holder as set forth in claim 2, wherein  
5 said holder body has a plurality of spike elements arranged so as to be consistent with the arrangement of said surrounding wall members, and each of the molded lid members is penetrated by a corresponding spike element, whereby the temporary holding of said lid members by said holder body is achieved  
10 by the penetration of the spike elements into the molded lid members.

11. A lid-member holder as set forth in claim 10, wherein  
a configuration of the spike elements is controlled to thereby regulate a holding force with which said lid members are held  
15 by said holder body.

12. A lid-member holder as set forth in claim 2, wherein  
said holder body is made of a suitable resin material which is different from the resin material for said lid members, and the temporary holding of said lid members by said holder body  
20 is achieved by an adhesive force acting on interfaces between said plate-like holder body and said molded lid members.

13. A lid-member holder as set forth in claim 12, wherein  
a surface of said holder body is subjected to a rough surface treatment, and the molded lid members are in mechanical  
25 engagement with the treated rough surface of said holder body, whereby the temporary holding of said lid members by said holder body is further achieved by the mechanical engagement between the molded lid members and the treated rough surface of said holder body in addition to the adhesive force acting  
30 on the interfaces between said plate-like holder body and said molded lid members.

14. A lid-member holder as set forth in claim 13, wherein  
a roughness of the treated rough surface of said holder body

is controlled to thereby regulate a holding force with which said lid members are held by said holder body.

16. A lid-member holder as set forth in claim 2, wherein  
said holder body is made of a suitable resin material, and is  
5 formed with a plurality of openings arranged so as to be  
consistent with the arrangement of said surrounding wall  
members, and a plurality of radial needle elements are  
integrally and inwardly protruded from an inner peripheral  
wall face of each opening such that each of the molded lid  
10 members is mechanically engaged with the radial needle  
elements of a corresponding opening, whereby the temporary  
holding of said lid members by said holder body is achieved  
by the mechanical engagement between each molded lid member  
and the radial needle elements of each opening.

15 17. A lid-member holder as set forth in claim 16, wherein  
a number of the radial needle elements of each opening is  
controlled to thereby regulate a holding force with which said  
lid members are held by said holder body.

18. A lid-member holder as set forth in claim 16, wherein  
20 a thickness of said radial needle elements is controlled to  
thereby regulate a holding force with which said lid members  
are held by said holder body.

19. A lid-member holder as set forth in claim 1, wherein  
said lid members are made of a suitable material except for  
25 a resin material, and the temporary holding of said lid members  
by said holder body is achieved by adhering said lid members  
to said holder body with a suitable adhesive resin.

20. A lid-member holder as set forth in claim 1, wherein  
the sealing of said respective surrounding wall members with  
30 said lid members is achieved by adhering said respective lid  
members to said surrounding wall members with a suitable  
adhesive resin.

21. A lid-member holder as set forth in claim 1, wherein

the sealing of said respective surrounding wall members with said lid members is achieved by coupling said respective lid members to said surrounding wall members in an interference fit manner.

5        22. A lid-member holder as set forth in claim 21, wherein each of said lid members is formed with a recess for receiving a top end of a corresponding surrounding wall member, a size of said recess being somewhat smaller than that of the top end of said surrounding wall member at a usual ambient temperature, 10 and a material of said lid member has a coefficient of thermal expansion larger than that of the surrounding wall member.

15        23. A lid-member holder as set forth in claim 21, wherein each of said lid members is formed with a bulged portion for inserting it into a top end opening of a corresponding surrounding wall member, a size of said bulged portion being somewhat larger than that of the top end opening of said surrounding wall member at a usual ambient temperature, and a material of said lid member has a coefficient of thermal expansion smaller than that of the surrounding wall member.

20        24. A lid-member holder as set forth in claim 1, wherein each of said lid members is provided with an additional function which is obtained by processing said lid members in a lump, with the lid members being temporarily held by said holder body.

25        25. A lid-member holder as set forth in claim 24, wherein said additional function is an electromagnetic shield which is obtained from an electrically-conductive layer formed on each of the lid members.

30        26. A sealing process for sealing a plurality of surrounding wall members with a plurality of lid-members to define envelopes encapsulating electronic components in production of hollow-package type electronic products, which process comprises:

preparing an arrangement of said surrounding wall members;

5 preparing a holder body carrying said lid members temporarily held thereby, with said lid members being arranged so as to be consistent with the arrangement of said surrounding wall members;

positioning said respective lid members, held by said holder body, with respect to said surrounding wall members so as to be aligned and registered with each other;

10 attaching said respective lid members to said surrounding wall members in a lump to thereby seal said surrounding wall member with said lid member, resulting in the definition of said envelopers; and

15 separating said holder body from said lid members after the completion of the sealing of said surrounding wall members with said lid members, without said lid members being removed from said surrounding wall members.

20 27. A lid-member holder as set forth in claim 26, wherein the sealing of said surrounding wall members with said lid members is achieved by adhering said respective lid members to said surrounding wall members with a suitable adhesive agent.

25 28. A lid-member holder as set forth in claim 26, wherein the sealing of said surrounding wall members with said lid members is achieved by coupling said respective lid members to said surrounding wall members in an interference fit manner.